ORIGINAL FILE

Satellite Broadcasting and Communication Association of America

January 19, 1988

Mr. William J. Tricarico
Secretary
Federal Communications Commission
Room 222
1919 M Street, N.W.
Washington, D.C. 20554

Re: MM Docket No. 87-268
RM-5811
Advanced Television Systems

Dear Mr. Tricarico:

Enclosed for filing in the above-referenced proceeding, please find enclosed an original and 12 copies of the SBCA's Reply Comments.

If it is possible, I would request that you return one copy of this pleading with your file-date stamp thereon. A stamped, addressed return envelope is enclosed for this purpose.

Thank you.

Sincerely,

Mark C. Ellison
Vice President
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and General Counsel

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Before the

FEDERAL COMMUNICATIONS COMMISSION

Washington, D.C. 20554

In the Matter of	]	
	]	
Advanced Television Systems and Their Impact on the Existing Broadcast Service	]	MM Docket No. 87-268
	]	RM-5811
	]	

REPLY COMMENTS OF THE SATELLITE BROADCASTING AND COMMUNICATIONS ASSOCIATION OF AMERICA

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REPLY COMMENTS OF THE SATELLITE BROADCASTING AND COMMUNICATIONS ASSOCIATION OF AMERICA

The Satellite Broadcasting and Communications Association of America (SBCA), by its undersigned general counsel, hereby submits its Reply Comments to the comments submitted in response to the Commission's Notice of Inquiry on Advanced Television Systems ("NOI"), MM Docket No. 87-268.

I. INTRODUCTION

In its initial Comments, the SBCA stressed the importance of allowing the satellite television industry to develop and implement high definition television (HDTV) and other forms of advanced television service (ATV) without being impeded by the imposition of inappropriate standards or the reallocation of spectrum.

The SBCA advised that direct broadcast satellite (DBS) service is about to become a reality and that such service is capable of immediately implementing HDTV service.

In various comments filed in this proceeding, a number of companies and organizations have, to one degree or another, argued that: (1) the Commission should impose a standard for ATV and HDTV, and (2) the Commission should reallocate or consider the reallocation of a portion of the band 12.2-12.7 GHz for terrestrial broadcasting. Other commenters have voiced the opinion that one or another specific HDTV/ATV delivery format is the most advanced and should be adopted as a de facto, if not, de jure standard.

For the reasons stated herein, the SBCA submits that: (1) the creation of standards for HDTV/ATV at this time is premature and could have a serious adverse effect on the delivery of HDTV through DBS; (2) in the event standards are adopted for HDTV/ATV for terrestrial broadcasting, such standards should not be inconsistent with satellite distribution or broadcasting of ATV in terms of either bandwidth or format; and (3) the Commission should not alter the existing allocation of the 12.2-12.7 GHz band to DBS.

II. THE COMMISSION SHOULD NOT IMPOSE STANDARDS FOR THE DELIVERY OF HDTV AT THIS TIME OR, IF STANDARDS ARE IMPOSED FOR TERRESTRIAL DELIVERY, THEY SHOULD NOT HAMPER THE DEVELOPMENT OF DBS.

Several of the parties filing comments in this proceeding have advocated the position that the Commission should mandate a single standard for HDTV/ATV. The SBCA submits that the

imposition of a single standard for all delivery technologies at this time would be a grievous error. A standard which may be suitable for terrestrial broadcasting or videocassettes may preclude or be detrimental to other delivery mechanisms such as DBS or cable. This market must be given time to develop freely.

Satellite delivery systems for DBS and cable are not constrained by the inherent problems of terrestrial broadcasting. It would be nothing short of a tragedy to cripple the vast potential of DBS by burdening it with some standard aimed primarily at meeting the constraints imposed by terrestrial broadcasting.

In a well considered and thorough pleading, the Association of Maximum Service Telecasters ("MST") recognizes that,

> Consideration of certain issues such as standards, flexible allocations, and interference-trading is premature. It would be counterproductive to adopt positions on such questions as appropriate standards for ATV compatibility until more is known about specific spectrum needs and characteristics of the candidate ATV systems. (MST Comments at p. iii - iv.)

In this regard, the SBCA also points to the comments of Time Incorporated (Time Inc.) which advocates allowing each distribution medium to have the freedom to maximize its potential for the delivery of programming.

> The Commission must be cautious lest it impose technical standards for one medium that would prevent another medium from realizing its full potential for the delivery of high quality video signals to television viewers. To do so would be to deny consumers benefits they should receive. (Comments of Time Inc., p.21)

With 24 MHz of RF channel bandwidth and 5 MHz of guard band between co-polarized adjacent channels, DBS can, today, deliver, within a baseband bandwidth constraint of 8 to 10 MHz, an ATV signal of very high quality and with the potential to serve virtually every American household, no matter how remote. The potential of DBS would be greatly reduced if it were burdened with an ATV bandwidth limitation geared to terrestrial broadcasting.

If, for example, an ATV standard for 6 MHz bandwidth terrestrial broadcasting were imposed on DBS, the true potential of DBS would be lost. Further, by forcing more information into the 6 MHz bandwidth to "create" ATV, the carrier-to-noise ratio will decrease, the signal will become more susceptible to interference, and, consequently, NTSC quality will decrease even more than it did for monochrome when the existing color standard was imposed. Similarly, a standard requiring baseband bandwidth beyond about 8 MHz would, within a 24 MHZ channel bandwidth, reduce the FM improvement employed in DBS delivery, thereby requiring either a higher satellite power flux density ("pfd") or a larger home terminal antenna to achieve the same carrier to noise signal quality.

It should also be recognized that satellite distribution and broadcasting are not rigidly restricted to channel bandwidths of 24 MHz (and corresponding baseband bandwidth of about 8 MHz). Most trandponders available for television program distribution in the FSS at both C and Ku band, have bandwidths wider than 24 MHz. Moreover, the RARC-83 Plan for BSS in the 12.2-12.7 GHz band was drawn with sufficient flexibility that two or more adjacent 24 MHz channels can be combined to permit the transmission of ATV signals requiring baseband bandwidths significantly greater than 8 MHz.

The importance of an artifact-free format and adequate carrier-to-noise ratio has been recognized by the Satellite Communications Section of the Information and Telecommunications Technologies Group of the Electronic Industries Association (the "Section") in their argument that satellite transmission should not be impaired "by constraints in either video baseband bandwidth or the particulars of the format itself." Quite supportive of the SBCA's position is the following from those comments:

> Also, of issue in the satellite transmission is performance in noise....Because of the increased resolution in a high definition television system, noise will be a much more important factor in the final appearance of the picture on the end user's television monitor. The Section feels that formats for satellite transmission should be allowed to develop that will be optimum over the satellite while not necessarily being optimum for off-air broadcast. (Section Comments at p. 2.)

The comments of Hughes Communications Galaxy, Inc., Time Inc., and HBO, Inc. urge free development of the marketplace to allow each medium to maximize its potential in the delivery of HDTV. The SBCA concurs with that position. The Commission must not, at this early stage, impose a standard. However, if the Commission does feel constrained to impose any standard, it should limit the application of such standard only to terrestrial broadcasting and such standard should not be allowed to affect, in any way, satellite transmission.

III. SPECTRUM ALLOCATION ISSUES

As recently as October, 1987, the Commission issued an Order denying requests to reserve a portion of the 12.2 - 12.7 GHz spectrum for terrestrial broadcasting. (Order in FCC 87-327, General Docket No. 85-172, In the Matter of Further Sharing of the UHF Television Band by Private Land Mobile Radio Services.) In that Order, the Commission reaffirmed the position that the full 12.2-12.7 GHz band is essential for DBS (i.e., broadcasting satellite service ["BSS"]), and that the reallocation of a portion of that spectrum for terrestrial broadcasting of ATV would be disruptive to the development of DBS. Further, the Commission recognized in the Order that, "...the technical hurdles to implementation of a terrestrial ATV system in the 12.2 - 12.7 GHz band raise substantial

questions as to whether this band would prove suitable for terrestrial ATV." (Id., paragraph 9.)

The statements of the Commission in this regard are sound. The comments of those parties in the instant proceeding urging a reallocation of the 12 GHz band are technically unsupportable and are, in the opinion of the SBCA, nothing more than attempts to preclude the full development of a potential competitor.

Perhaps the strongest advocate of spectrum reallocation in this proceeding is CBS Inc. On pages 37 and 38 of its comments, CBS (1) expresses its continued belief that the 12.2-12.7 GHz band "holds promise for terrestrial broadcasting", (2) advises that "the prospects are diminishing for the institution of DBS service using a significant portion 12 GHz spectrum...", and (3) concludes that DBS service can find adequate bandwidth by migration to the Fixed Satellite Service (at 11.7 - 12.2 GHz). We would submit that each of the views expressed by CBS are wholly untenable.

First, as the SBCA has noted in previous filings, both in this proceeding and in General Docket No. 85-172, the prospects for terrestrial broadcasting in the 12 GHz band are extremely grim. Problems of severe rain attenuation, multipath propagation resulting in ghosting, line-of-sight impairments, and significant interference considerations render this band

unsuitable for terrestrial broadcasting. Our position is bolstered by the Comments of MST, at page 43, where it is stated,

> Finally, the propagation characteristics of the frequencies above 1 GHz would make it difficult for broadcasters to provide coverage to their present service area. Indeed, use of the 12 GHz or higher frequencies would appear to require major technological breakthroughs (emphasis added).

Along those same lines, the Comments of National Broadcasting Company, Inc. (NBC) and Comments of The David Sarnoff Research Center, Inc. (Sarnoff) clearly counter the CBS assertions and raise serious questions about the completeness and applicability of the CBS/Westinghouse 12 GHz propagation tests with respect to practical HDTV terrestrial broadcasting systems. As NBC notes pertaining to the use of microwave frequencies for terrestrial broadcasting,

> Propagation factors at these higher frequencies would seriously limit broadcast coverage, particularly in more heavily built-up areas. The use of multiple transmitters could be explored, but this would almost certainly increase the expense of ATV transmission. (NBC at p. 16.)

Sarnoff expresses similar concerns, stating,

> ....HDTV service should be accommodated in the UHF and VHF bands, in preference to terrestrial broadcasting in the 2.5-2.69 GHz, the 12.2-12.7 Ghz or the 22-23 GHz bands...This advantage (of available spectrum for use by terrestrial broadcasting) is offset by serious technical problems such as rain fading, physical blockage, poor coverage, multipath, and interference, which are of greater concern in the context of high

quality HDTV services than for conventional TV broadcasting. (Sarnoff at p. 16.)

Secondly, and again largely in response to the Comments of CBS, the SBCA would take issue with the assertion that the prospects for DBS are diminishing. To the contrary, it appears that the advent of true high-powered DBS service utilizing the 12.2-12.7 GHz band is at hand. At least one DBS permittee has satellites under construction and is planning a launch for the early 1990's. Other permittees are in various stages of planning DBS operations. Additionally, there is a heightened awareness of and interest in direct satellite television among consumers, programmers, the electronics industry, and the Congress. Rather than diminishing, the SBCA submits that the prospects for DBS are brighter than ever.

To be effective and economically viable, however, it is essential that BSS service have available the full 500 MHz bandwidth in the 12.2-12.7 GHz band. In order to have a single 32-channel system in the face of interference between adjacent, partially overlapping carriers on opposite polarizations, the satellite provider must place two satellites into orbit (separated by 4/10ths of a degree as provided in the RARC-83 Plan), each with no more than 16 channels (transponders) of the same polarity. This arrangement, combined with the 9 degree orbital spacing between copolarized satellites of the RARC-83 Plan, will allow reception of all 32 avalable channels with a simple home terminal dish antenna two feet in diameter. If

one-half of the DBS band were reallocated to another service, each satellite in the system could have no more than 8 channels. The resulting 16-channel BSS system would, in all likelihood, be too expensive for programmers and unattractive to consumers, and, generally, would seriously impair the prospects for BSS service.

Similarly, "broadcasting" in the 11.7-12.2 GHz band is simply not, as has been suggested by CBS, an acceptable alternative for DBS. Because of the 2-degree satellite spacing and corresponding co-channel interference problems, home terminal antenna diameters to receive ATV transmissions from FSS satellites (with the same carrier-to-interference signal quality) would need to be four and one-half times larger than those usable with BSS satellites spaced 9 degrees apart.* Accordingly, FSS service could never have the potential for universal availability offered by the 12.2-12.7 GHz BSS band. Should the satellite spacing in a high-power segment of the 12 GHz FSS band be reduced to 1.5 degrees, as recently proposed by the FCC, the home terminal satellite antenna for the same satellite-to-satellite interference level would have to be six times larger than those required for the 12 GHz BSS band, regardless of the pfd for the service.

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* All other things being equal, for a signal whose quality is directly proportional to the carrier-to-interference ratio, the ratio of antenna diameters must be as large as the ratio of orbital spacings.

Finally, the Commission and terrestrial broadcasters should bear in mind that until the entire 12 GHz band is utilized by the DBS service, any unused portion should remain available for the existing terrestrial fixed service to which it was previously allocated.

IV. CONCLUSION

As noted in our prior filings, DBS holds tremendous promise, not only because of its its unique capability for the nationwide delivery of ATV and HDTV service, but also because of the high video and audio quality, program diversity potential, and universal service capability. The Commission has shown great foresight in its initial actions which allocated the 12.2-12.7GHz band for DBS and in recent decisions affirming those actions. We would urge the Commission to find that the issue of allocation of 12GHz spectrum for DBS is settled, once and for all. The Commission's patience and faith in the promise of DBS is about to be rewarded.

The SBCA respectfully urges the Commission to approach the dawning of this new era in television with great care. The premature and overly broad imposition of standards upon ATV/HDTV must be avoided. Competing technologies and the marketplace must be permitted to develop freely, unconstrained by standards developed for only <u>one</u> of the delivery technologies. Likewise, in order to meet its potential, the DBS

industry must be assured that the full 12.2-12.7 GHz band will remain available. Accordingly, the SBCA would urge the Commission to strongly resist the petitions of competing media for any reallocation of such spectrum.

Respectfully submitted,
Satellite Broadcasting and
Communications Association

January 19, 1988

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